

A CONTRIBUTION TO THE TAXONOMY OF *TRIGLOCHIN* (JUNCAGINACEAE)

D. A. Cooke* and R. J-P. Davies**

c/- State Herbarium, Botanic Gardens,
North Terrace, Adelaide 5000

Abstract

Triglochin ovoideum J. Black is shown to be a synonym of *T. hexagonum* J. Black. *T. muelleri* Buchen. is endemic to Western Australia, previous records of this species for South Australia being due to misdeterminations.

Triglochin ovoideum

Triglochin ovoideum J. Black has been recorded only from a few localities along the Murray River within South Australia and was therefore treated as a vulnerable species by Leigh et al. (1981). In its vegetative and floral morphology it cannot be separated from the more widespread *T. hexagonum* J. Black, and was stated by Black (1940, 1943) to differ only in the fruit which was ovoid with the fertile carpels lacking the paired scarious wings, each two-pointed, which characterise the latter species.

Examination of the type of *T. ovoideum* revealed narrow scarious wings developed from the inner faces of the fruiting carpels, as had been noted by Black in his autograph comments on the type sheet. These wings are often produced into two points on each side of the carpel, and differ only in length from those in specimens which Black had accepted as *T. hexagonum*. To provide a quantitative measure of difference in this character, a morphometric study was made of fruiting carpels from nine collections representing a range from the type of *T. ovoideum* to material from inland Western Australia with strongly winged carpels. Each collection comprised several individuals and was treated as a population sample from which 10 carpels were selected at random, manifestly unripe or damaged fruits being rejected. A binocular microscope with an eyepiece graticule was used at a magnification of 40x (Fig. 1.) to measure the following linear dimensions for each carpel:

A: Maximum width (across the lateral points if present).

B: Width across the centre of the carpel.

C: Overall length.

Table 1. Values of (A-B)/C for the nine collections sampled.

Collection	Mean	Standard deviation (S)
Lake Bonney, C.D. Andrew (AD 98733020)	0.04	0.04
Purnong, R. Davies et al 136	0.10	0.04
Purnong, R. Davies et al 137	0.11	0.04
Blanchetown, Eichler 18177	0.12	0.04
Big Swamp, Alcock 2643	0.16	0.06
Lake Bonney, C.D. Andrew (AD 97826054)	0.19	0.06
Palm Valley, Latz 791	0.30	0.05
Margaret Overflow, Weber 5697	0.31	0.11
Beru Pool, Chinnock 756	0.46	0.04

*Animal and Plant Control Commission, P.O. Box 1671, Adelaide 5001.

**BIOSIS Research Propriety Ltd, 51 Camberwell Road, Hawthorn East 3123.

The relation $(A-B/C)$ was chosen to represent the development of the lateral points in proportion to the size of the carpel; this was calculated for each carpel measured and expressed as a mean for each collection (Table 1). As shown in Fig. 2, there is a continuous variation in this character among the nine collections. There is a tendency for the value of $(A-B/C)$ to be highest in the western and inland portion of the geographic range and lowest on the Murray River. However, the character does not support a qualitative division into two species despite the incomplete knowledge of variation in *T. hexagonum* in Western Australia and the Northern Territory.

In the absence of any other characters to separate them, *T. hexagonum* and *T. ovoideum* are here united under the former name, for which an emended description is supplied.

Triglochin hexagonum J. Black, Trans. R. Soc. S. Aust. 49:270 (1925).

Type: "near Lake Bonney, River Murray, H.W. Andrew" (Lecto: AD 97826054 p.p.! possible iso: K n.v.). There are two elements on AD 97826054 used by Black in preparing the protologue. The fruiting specimen labelled 'A' by Black is the only one to which the type citation can apply, and fruit characters were used to separate this species from other annual *Triglochin*. This is therefore designated as the lectotype.

Material grown by Black in a pot and pressed in September, 1925 was used in preparing drawings of the whole plant and floral structure. Another specimen on the sheet, dated February, 1926, cannot be type material due to the date. Nor can two collections by R. Tate, which Black did not mention in his protologue.

Although the collection was attributed by Black to H.W. Andrew, both this specimen and the specimen in K are annotated "C.D. Andrew". As C.D. Andrew (née Black) was the wife of H.W. Andrew who supplied specimens to Black, this imprecision may be explained.

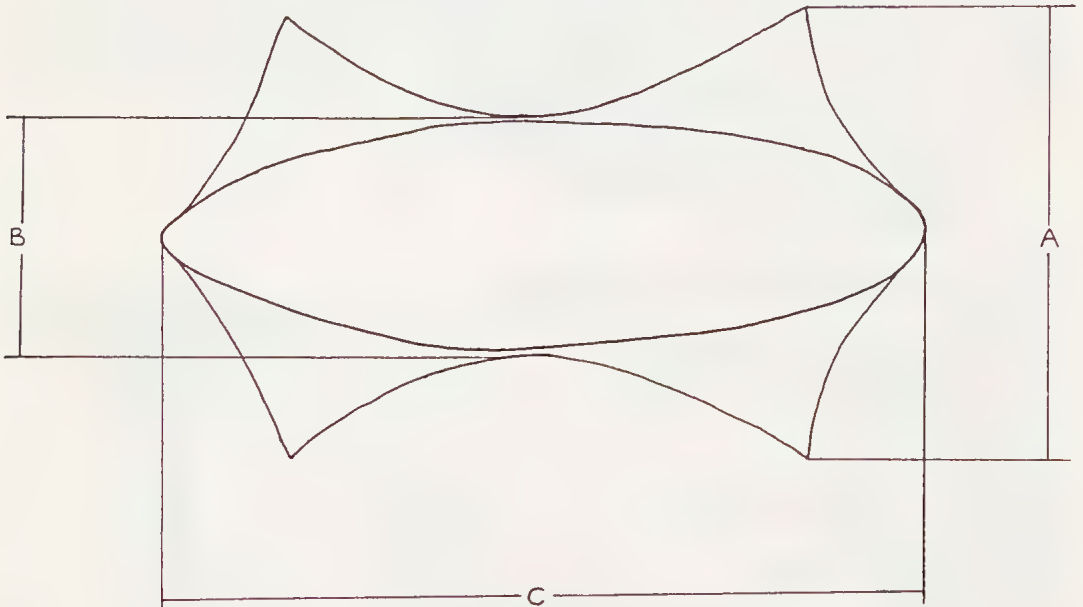


Fig. 1. Fertile fruiting carpel of *T. hexagonum* (diagrammatic) showing the linear distances A, B and C.

T. ovoideum J. Black, Trans. R. Soc. S. Aust. 64:371 (1940).

Type: "beside Lake Bonney, River Murray, xii.1924, C.D. Andrew" (Lecto: AD 98733020 p.p.!; possible iso: MEL 1551076!; K n.v.). The sheet AD 98733020 includes a fruiting collection labelled "Lake Bonney (Barmera) River Murray 1924 C.D.A." This is here designated the lectotype. MEL 1551076 is apparently a portion of the same collection and was labelled "co-type" by Black although the date is given as xi.1924 on the label. AD 98733020 also includes material grown in cultivation and pressed in 1925.

Annual or ephemeral herb. *Stem* extremely short, branching from the lower leaf axils to form a dense tuft. *Leaves* numerous, basal, obscurely distichous; sheaths equitant, 2.5-8 mm long, membranous, microscopically scabrous on the midvein, ending abruptly in two shortly acuminate auricles; laminae filiform, terete, lax, 8-70 mm long, glabrous; apex obtuse. *Scapes* suberect, filiform, terete, 6-70 mm long, glabrous. *Raceme* 6-42-flowered, initially compact, becoming looser in fruit, ultimately 5-40 mm long. Terminal *flower* bisexual; outer tepals 3, patent, obovate, c. 1 mm long, white; inner tepals 3, erect, ovate, very short; outer *stamens* 3, with suborbicular anthers c. 0.5 mm wide; inner stamens 3, smaller. All other flowers female; tepals 3-5, unequal, lanceolate, 0.2-0.5 mm long, membranous, persistent. *Fruits* 1-2.2 mm long, glabrous, stramineous, on pedicels 0.25-1 mm long. *Sterile carpels* 3, fused, forming a persistent membranous columella 1-2 mm long. *Fertile carpels* 3, acute, dorsally convex and smooth, ventrally concave with scarious lateral wings which may be vestigial, or prominent and produced into two pairs of triangular points up to 0.4 mm long giving the carpel a more or less hexagonal outline.

Distribution

T. hexagonum has been collected in Western Australia, Northern Territory, South Australia and Victoria. In South Australia, collections were from the Northwestern, Lake Eyre, Eyre Peninsula and Murray regions.

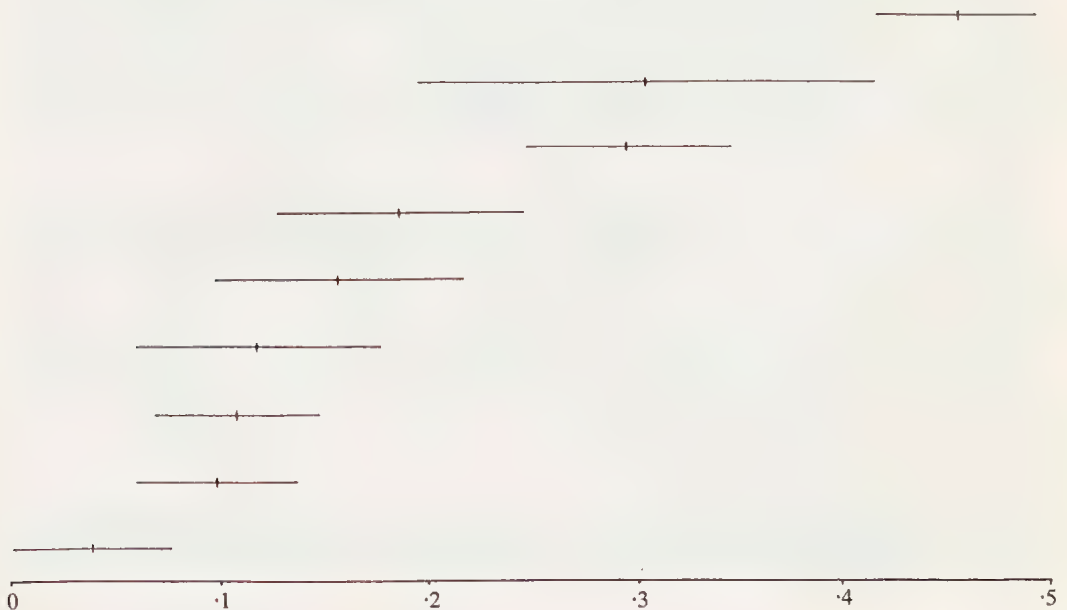


Fig. 2. Mean values of (A-B)/C for each collection; bars represent one standard deviation each side of the mean. 1, Lake Bonney, C.D. Andrew (AD 98733020); 2, Purnong, R. Davies et al. 136; 3, Purnong, R. Davies et al. 137; 4, Blanchetown, Eichler 18177; 5, Big Swamp, Alcock 2643; 6, Lake Bonney, C.D. Andrew (AD 97826054); 7, Palm Valley, Latz 791; 8, Margaret Overflow, Weber 5697; 9, Beru Pool, Chinnock 756.

Ecology

Habitats include margins of semi-saline wetlands along the Murray; swamps on southern Eyre Peninsula; and edges of streams in mountain ranges, intermittently flooded flats and sandy saline outwash areas in Central Australia. Soils at collection sites varied from wet sands to black clayey silts. Associated vegetation included *Atriplex paludosa* association, *Halosarcia* dwarf open-shrublands, and open-herblands or sparse herblands dominated by *Mimulus repens* and surrounded by *Muehlenbeckia cunninghamii*. Flowering occurs from October to March in southern South Australia, but opportunistically throughout the year in Central Australia.

Specimens examined

WESTERN AUSTRALIA: Beru Pool, Yelma Station, 5.ix.1973, *R.J. Chinnock 756* (AD 97347283); Lake Annean, 21.viii.1960, *A.S. George 924* (PERTH); c. 3 miles E of North-West Cape lighthouse, 3.vi.1961, *A.S. George 2519* (PERTH).

NORTHERN TERRITORY: Palm Valley, 28.ix.1970, *P.K. Latz 791* (AD 97107805); 9 km E Rabbit Flat, 7.vii.1980, *P.K. Latz 8458* (MEL 576426).

SOUTH AUSTRALIA: Big Swamp, Hd. of Uley, 22.ii.1969, *C.R. Alcock 2643* (AD 96930264); River Murray near Yalco Lagoon, 25.iv.1970, *W.R. Barker 795* (AD 97109163); Murbko, lower Murray River, 19.ii.1973, *R.J. Chinnock 50* (AD 97320058); 2 km NW Purnong, 1.3 km SE of main road, 4.xii.1986, *R. Davies, D. Cooke & P. Green 136* (AD); 1 km NW Purnong, 2.9 km SE of main road, 4.xii.1986, *R. Davies, D. Cooke & P. Green 137* (AD); Purnong Landing, lagoon on W side of River Murray, 3.iv.1958, *H. Eichler 14905* (AD 97615462); Blanchetown, River Murray flats, 25.iii.1965, *H. Eichler 18176* (AD 96649104); Blanchetown, 3.iv.1965, *H. Eichler 18177* (AD 96649085); Margaret Overflow, c. 5 km W Curdimurka, 3.x.1978, *J.Z. Weber 5697* (AD 97341324); Mannum, 5.iii.1883, n. coll. (AD 97507203).

VICTORIA: Lochiel Salt Lake, NW Dimboola, 20.ix.1968, *A.C. Beauglehole 28559* (MEL 1515863).

Triglochin muelleri

Triglochin muelleri was first recorded for South Australia by Black (1925) on the basis of the collection from Lake Bonney which he later redetermined and used as the holotype of *T. ovoideum* (Black, 1940) after having seen type material of *T. muelleri* Buchen. from MEL. However, the misconception that *T. muelleri* was present in South Australia had become established and the name was misapplied to material of *T. trichophorum* Nees ex Endl. The descriptions of *T. muelleri* in Black (1943) and Randell (1986) were based on the specimens of the latter species cited below.

T. muelleri is characterised by virtually sessile, obtuse, ellipsoidal fruits "scarcely 2 mm long" (Buchenau, 1903); in type material in MEL (Vasse River, Western Australia, n.d., *A. Oldfield*) the fruits are 1.3-1.8 mm long. The South Australian specimens here referred to *T. trichophorum* have acute, narrow-ovoid fruits 2.0-2.5 mm long on pedicels 1.0-2.5 mm long in racemes which are shorter and denser than the spikes of *T. muelleri*.

No collections of *Triglochin* from South Australia in AD or MEL are referable to *T. muelleri*, and it is concluded that this species is endemic to Western Australia. Within that State it is restricted to the coastal plain in the Perth and Busselton areas (Rye, 1987).

Specimens examined

WESTERN AUSTRALIA: Twin Swamps Reserve, 17.ix.1970, *A.S. George 10392* (PERTH); Wonnerup, 16.x.1960, *R.D. Royce 3369* (PERTH); Wonnerup, 17.x.1952, *R.D. Royce 3873* (PERTH); Busselton district, 3.xi.1955, *R.D. Royce 5172* (PERTH); Abba River, Busselton district, 18.x.1956, *R.D. Royce 5635* (PERTH); Cannington, x.1921, *C.H. Sargent s.n.* (PERTH).

Triglochin trichophorum

Triglochin trichophorum Nees ex Endl., in Lehm., Pl. Preiss. 2:54 (1846).

Type: Rottneest Island, W.A., 20.viii.1839, *L. Preiss 2411* (Iso: MEL!).

Specimens examined

SOUTH AUSTRALIA (all formerly determined as *T. muelleri*): Corny Point, Yorke Peninsula, 1.x.1957, *H. Eichler 14181* (AD 95818032); cultivated from Pearson Island material, *H. Eichler 20664* (AD 98202256); Venus Bay, Eyre Peninsula, 16.ix.1938, *C.W. Johns s.n.* (AD 97701246); Pearson Island, ix.1923, *T.G. Osborn s.n.* (AD 97507205 p.p.); Hiltaba homestead, Eyre Peninsula, 5.ix.1972, *A.G. Spooner 2318* (AD 97246109); near Hell's Gates, Younghusband Peninsula, 10.ix.1974, *L.D. Williams 5733* (AD 97524422).

WESTERN AUSTRALIA: Cape Naturaliste, 17.x.1978, *T.E.H. Aplin 6446* (PERTH); 25 miles S Mandurah, 5.vii.1969, *A.S. George 9370* (PERTH); Yalgorup National Park, 19.ix.1981, *G.J. Keighery 4030* (PERTH); Busseton, 30.ix.1953, *R.D. Royce 4553* (PERTH); Rottne Island, 20.ix.1956, *R.D. Royce 5467* (PERTH); Nambung National Park, 14.ix.1972, *R.D. Royce 10307* (PERTH); Keru Island, 2.ix.1972, *N. Sammy 52* (PERTH).

Acknowledgements

We wish to thank the State Herbarium of South Australia, where this paper was prepared, and the National Herbarium of Victoria for the loan of specimens; also Jean Turner and David Potter for assistance with fieldwork. Thanks are also due to Terry Macfarlane, who checked possible type material at Kew Herbarium.

References

- Black, J.M. (1925). Additions to the Flora of South Australia No. 23. *Trans. R. Soc. S. Aust.* 49: 270-275.
 Black, J.M. (1940). Additions to the Flora of South Australia No. 39. *Trans. R. Soc. S. Aust.* 64: 371-372.
 Black J.M. (1943). "Flora of South Australia". edn 2. Part 1. (Govt Printer: Adelaide).
 Buchenau, F. (1903). Scheuchzeriaceae. *Pflanzenreich* 4(14).
 Leigh, J., Briggs, J. & Hartley, W. (1981). Rare or Threatened Australian Plants. *Australian National Parks and Wildlife Service Special Publication No. 7*.
 Randell, B. (1986). Juncaginaceae. In Jessop, J.P. & Toelken, H.R. (eds) "Flora of South Australia". edn 4. Part 4. (Govt Printer: Adelaide).
 Rye, B. (1987). Juncaginaceae. In Marchant, N.G. et al. (eds) "Flora of the Perth Region". Part 2. (Western Australian Herbarium: Perth).